SECTION 07 84 13

FIRESTOPPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications, apply to this Section.

1.2 SCOPE

A. This section of the specifications covers the provision of all labor, materials, tools, equipment, and the performance of all work and services necessary or incidental to provide and install all firestopping and accessories as shown on the drawings and as specified, in accordance with the provisions of the Contract Documents, and completely coordinated with the work of all other trades.

B. Although such work may not be specifically shown or specified, provide and install all supplementary and / or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

C. Notwithstanding reference to any manufactured or produced item or material in this specification that contains asbestos, materials or items that contain asbestos are not acceptable. In the event that any of the materials or items specified herein contain asbestos, the Architect shall be promptly notified in writing and the Architect will select a suitable substitute material or item or system which shall be furnished at no additional cost to the Owner.

D. Provide firestop systems consisting of a material, or combination of materials installed to retain the integrity of fire resistance rated construction by maintaining an effective barrier against the spread of flame, smoke and / or hot gases through penetrations, fire resistive joints, and perimeter openings in accordance with the requirements of the Building Code for this project.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. Only tested firestop systems shall be used in specific locations as follows:

1. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire - rated vertical barriers (walls and partitions), horizontal barriers (floor / ceiling assemblies), and vertical service shaft walls and partitions. All partition walls in the existing building shall be considered to have a 1 hour (minimum) fire rating. All floor / ceiling assemblies and ceiling / roof assemblies in the existing building shall be considered to have a 1 hour (minimum) fire rating.

2. Openings and penetrations in fire - rated partitions or walls containing fire doors. All partition walls in the existing building shall be considered to have a 1 hour (minimum) fire rating.

3. Walls, floors and ceilings in areas of new work that are designated on plans as fire barriers shall have all new penetrations firestopped. All partition walls in the existing building shall be considered to have a 1 hour (minimum) fire rating. All floor / ceiling assemblies and ceiling / roof assemblies in the existing building shall be considered to have a 1 hour (minimum) fire rating.

1.4 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Basic Mechanical Materials and Methods are found elsewhere in Divisions 22 and 23.
2. Basic Electrical Materials and Methods are found elsewhere in Division 26.

1.5 CODES, SPECIFICATIONS AND STANDARDS

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only. Any material or operation specified by reference to the published specifications of a manufacturer or other referenced specification or standard shall comply with the requirements of the latest edition. In case of a conflict between a referenced specification or standard and these project specifications the more stringent requirement shall govern.

B. Comply with the applicable provisions of the following codes, specifications and standards to the extent indicated by reference thereto.

1. American Society of Testing and Materials - ASTM E 84, “Standard Test Method for Surface Burning Characteristics of Building Materials”.

2. American Society of Testing and Materials - ASTM E 119, "Standard Test Methods for Fire Tests of Building Construction and Materials".

3. American Society of Testing and Materials - ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops".

4. American Society of Testing and Materials - ASTM E 1399, "Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems".

5. American Society of Testing and Materials - ASTM E 1529, "Standard Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies".

6. American Society of Testing and Materials - ASTM E 1725, "Standard Test Methods for Fire Tests of Fire - Resistive Barrier Systems for Electrical System Components".

7. American Society of Testing and Materials - ASTM E 1966, “Standard Test Method for Fire Resistive Joint Systems”.

8. American Society of Testing and Materials - ASTM E 2174, “Standard Practice for On - site Inspection of Installed Fire Stops”.

9. American Society of Testing and Materials - ASTM E 2307 “Standard Test Method for

Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate - Scale, Multi - story Test Apparatus" .

10. American Society of Testing and Materials - ASTM E 2393, "Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers".

11. Underwriters Laboratories - UL 263 "Fire Tests of Building Construction and Materials".

12. Underwriters Laboratories - UL 723 "Tests for Surface Burning Characteristics of Building Materials".

13. Underwriters Laboratories - UL 1479 "Fire Tests of Through - Penetration Firestops".

14. Underwriters Laboratories - UL 1709 "Rapid Rise Fire Test of Protection Materials for Structural Steel".

15. Underwriters Laboratories - UL 2079 "Tests for Fire Resistance of Building Joint Systems".

16. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

    a. Firestop Devices (XHJI)
    b. Fire Resistance Ratings (BXRH)
    c. Through - Penetration Firestop Systems (XHEZ)
    d. Fill, Voids, or Cavity Material (XHHW)
    e. Forming Materials (XHKU)
    f. Joint Systems (XHBN)
    g. Perimeter Fire Containment Systems (XHDG)

17. Alternate System: Omega Point Laboratories (OPL) - "Directory of Listed Building Products, Materials & Assemblies - Volume II".

18. Alternate System: ITS - "Directory of Listed Products."

19. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments.

20. International Building Code - ICBO - 2006 Edition.

21. International Fire Code - ICBO - 2006 Edition.

22. National Fire Protection Agency - NFPA 101 "Life Safety Code".

23. National Fire Protection Agency - NFPA 70 "National Electric Code".

1.6 DEFINITIONS

A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.

B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling / floor assemblies and structural floors.

C. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors. An open joint between adjacent rated assemblies; may be a moving joint or static opening, without penetrating items.

D. Engineering Judgment: Evaluations that are developed by a manufacturer for a new firestop system that complies with similar UL or Omega Point approved designs or tests that are acceptable to the code and enforced by the local jurisdictions. Reference E2032 for current definition

E. Fire Resistive Joint: Any joint or opening, whether static or dynamic, within or between adjacent sections of fire rated interior or exterior walls, floors, ceilings or roof decks.

F. Fireblocking: Building materials installed to resist the free passage of flame, smoke and noxious gases to other areas of the building through concealed spaces.

G. Firestopping: Material or combination of materials used to retain integrity of fire - rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

H. Intumescent: Materials that expand with heat to seal around objects threatened by fire.

I. Listing: The current, published listing of a system in a qualified listing agency's directory.

J. Listing Agency: Independent testing agency that has conducted tests and classified firestop systems for particular applications, which conducts routine in - plant follow - up inspections, and which lists tested systems in a published directory.

K. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained. Penetrations include through - penetration and membrane penetration.

L. Penetrating Item: Any item (pipe, duct, conduit, cable, etc.) that passes completely through a rated assembly through an opening of any size.

M. Perimeter Fire Barrier System: The perimeter joint protection that provides fire resistance to prevent the passage of fire from floor to floor within the building at the opening between the exterior wall assembly and the floor assembly.

N. Rated Assembly: A wall, floor, roof / ceiling, or other construction which is required to have an hourly fire rating or a smoke resistance rating.

O. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

P. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

Q. Water Leakage Test: Systems tested and listed in accordance with ANSI / UL 1479.

1.7 SYSTEM DESCRIPTION

A. Design Requirements

1. Fire - rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement sound or vibration absorption, and at other construction gaps.

2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and types of construction and at all separations required to permit building movement and sound or vibration absorption, and at other construction gaps.

B. Firestopping Exposed To View: Provide products with flame spread index of less than 25 and smoke developed index of less than 450, when tested in accordance with ASTM E 84.

C. Firestopping Exposed to View, Traffic, Moisture, or Physical Damage: Provide products that after curing do not deteriorate when exposed to those conditions during and after construction.

D. Penetrations: Provide through - penetration firestop systems that are produced and installed to resist the spread of fire, passage of smoke and other hot gases according to requirements indicated, to restore the original fire - resistance rating of barrier penetrated.

1. Provide and install complete penetration firestopping systems that have been tested and approved by nationally accepted testing agencies per ASTM E 814 or UL 1479 fire tests in a configuration that is representative of field conditions.

2. F - Rated Systems: Provide through - penetration firestop systems with F - ratings indicated, as determined per ASTM E 814 or UL 1479, but not less than one (1) hour or the fire resistance rating of the barrier being penetrated.

3. T - Rated Systems: Provide through - penetration firestop systems with T - ratings indicated, as well as F - ratings, as determined per ASTM E 814 or UL 1479, where required by the Building Code.

4. L - Rated Systems: Install through - penetration firestop systems with L - ratings as determined by UL 1479 and as required by the owner, architect or Authority Having Jurisdiction.

5. W - Rated Systems: Install through - penetration firestop systems meeting W - Rating Class 1 Requirements as determined by the UL Water Leakage Test for systems tested and listed in accordance with UL 1479 and as required by the owner, architect or Authority Having Jurisdiction.

6. For piping penetrations for plumbing and wet - pipe sprinkler systems, provide moisture - resistant through - penetration firestop systems.

7. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

8. Fire Resistive Joints: Provide joint systems with fire resistance assembly ratings indicated, as determined by UL 2079 (ASTM E 1399 and E 1966), but not less than the

fire resistance rating of the construction in which the joint occurs. Firestopping assemblies must be capable of withstanding anticipated movements for the installed field conditions.

9. For firestopping assemblies exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.

10. For floor penetrations exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.

11. Firestopping products shall have flame spread ratings less than 25 and smoke - developed ratings less than 450, as determined per ASTM E 84.

12. Where there is no specific third party tested and classified firestop system available for an installed condition, the firestopping contractor shall obtain from the firestopping material manufacturer an Engineering Judgment (EJ) to be submitted to the Approving Authority and Authority Having Jurisdiction for approval prior to installation. The EJ shall follow International Firestop Council (IFC) guidelines.

E. Single Source Limitations: Obtain firestop systems, for each kind of penetration and construction condition indicated from a single manufacturer, where possible.

1.8 QUALITY ASSURANCE

A. A manufacturer's direct representative (not distributor or agent) to be on - site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

B. Firestop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Firestop Systems do not reestablish the structural integrity of load bearing partitions / assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council.

1.9 SUBMITTALS

A. Product Data: Not required.

B. Provide material safety data sheets with product delivered to job - site.

C. Maintenance Data: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.

1. Details of each proposed assembly identifying intended products and applicable UL System number, or U.L. classified devices.

1.10 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer’s products per specified requirements.

B. Installer's qualifications: Firm experienced in installation or application of systems similar in complexity to those required for this project, plus the following:

1. Acceptable to or licensed by manufacturer, State or local authority where applicable.

C. At least 2 years experience with systems.

D. Successfully completed at least 5 comparable scale projects using this system.

E. Local and State regulatory requirements: Submit forms or acceptance for proposed assemblies not conforming to specific U.L. Firestop System numbers, or U.L. classified devices.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job - site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.12 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Scheduling:

1. Schedule installation of Cast in Place firestop devices after completion of floor formwork, metal form deck, or composite deck but before placement of concrete.

2. Schedule installation of other firestopping materials after completion of penetrating item installation but prior to covering or concealing of openings.

E. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

F. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

G. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.

H. Furnish adequate ventilation if using solvent.

I. Furnish forced air ventilation during installation if required by manufacturer.

1.13 WARRANTY

A. Submit copies of written warranty agreeing to repair or replace joint sealers which fail in joint adhesion, extrusion resistance, migration resistance, or general durability or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

PART 2 PRODUCTS

2.1 FIRESTOPPING, GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire - resistance - rated systems.

C. Firestopping Materials are either “cast - in - place” (integral with concrete placement) or “post installed.” Provide cast - in - place firestop devices prior to concrete placement.

2.2 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers as identified below:

1. Hilti, Inc.
2. Nelson Firestop Products.
3. 3M Fire Protection Products

4. USG Fire Stop Systems
5. No substitutions will be accepted.

B. Single Source: All instances of a specific firestop system shall be made using products of the same manufacturer; where multiple installers (e.g. different subcontractors) are responsible for installation of firestopping, all installers shall use the same system made by the same manufacturer.

2.3 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire - rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire - rating involved for each separate instance. Firestopping systems specified herein shall be manufacturers top - of - the - line products and shall be subject to compliance with specifications. Firestopping systems specified by brand name are products of Hilti, Inc. Comparable products of the other listed manufacturers shall be approved for use when found to be equal to those specified by the Architect.

1. Cast - in place firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and cable bundles penetrating concrete floors, the following products are acceptable:

   a. Hilti CP 680 Cast - In Place Firestop Device - Add Aerator adaptor when used in conjunction with aerator (“sovent”) system.

   b. Hilti CP 681 Tub Box Kit for use with tub installations.

   c. Hilti CP 682 Cast - In Place Firestop Device for use with noncombustible penetrants.

2. Sealants, caulking materials, or foams for use with non - combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

   a. Hilti FS - ONE Intumescent Firestop Sealant.
   b. Hilti CP 604 Self - leveling Firestop Sealant.
   c. Hilti CP 620 Fire Foam.
   d. Hilti CP 606 Flexible Firestop Sealant.
   e. Hilti CP 601s Elastomeric Firestop Sealant.

3. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

   a. Hilti CP 601s Elastomeric Firestop Sealant.
   b. Hilti CP 606 Flexible Firestop Sealant.
   c. Hilti FS - ONE Intumescent Firestop Sealant.

4. Sealants, caulking or spray materials for use with fire - rated construction joints and other gaps, the following products are acceptable:

   a. Hilti CP 672 Speed Spray.
   b. Hilti CP 601s Elastomeric Firestop Sealant.
   c. Hilti CP 606 Flexible Firestop Sealant.

d. Hilti CP 604 Self - leveling Firestop Sealant.

5. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

a. Hilti FS - ONE Intumescent Firestop Sealant.

6. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:

a. Hilti FS - ONE Intumescent Firestop Sealant.
b. Hilti CP 620 Fire Foam.
c. Hilti CP 601s Elastomeric Firestop Sealant.
d. Hilti CP 606 Flexible Firestop Sealant.

7. Non - curing, re - penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:

a. Hilti CP 618 Firestop Putty Stick.
b. Hilti CP 658T Firestop Plug.

8. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

a. Hilti CP 617 Firestop Putty Pad.

9. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

a. Hilti CP 643N Firestop Collar.
b. Hilti CP 644 Firestop Collar.
c. Hilti CP 645 / 648 Wrap Strips.

10. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

a. Hilti CP 637 Firestop Mortar.
b. Hilti FS 657 FIRE BLOCK.
c. Hilti CP 620 Fire Foam.
d. Hilti CP 675T Firestop Board.

11. Non curing, re - penetrable materials used for large size / complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

a. Hilti FS 657 FIRE BLOCK.
b. Hilti CP 675T Firestop Board.

12. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

a. Hilti CP 672 Speed Spray.
b. Hilti CP 601s Elastomeric Firestop Sealant.
c. Hilti CP 606 Flexible Firestop Sealant.
d. Hilti CP 604 Self - Leveling Firestop Sealant.

13. For blank openings made in fire - rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:

a. Hilti FS 657 FIRE BLOCK.
b. Hilti CP 658T Firestop Plug.

B. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E 814 which is equal to the time rating of construction being penetrated.

C. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

2.4 ACCESSORIES AND IDENTIFICATION LABELS

A. Provide all accessory materials required for complete installation; use materials specifically identified in system listings

B. Provide accessory products and materials as follows:

1. Aluminum Foil Tape: Type and size acceptable to wrap material manufacturer.

2. Filament Tape: Width minimum 3/4 inches.

3. Banding Material and Banding Clips: Carbon steel or stainless steel. Width 1/2 inch and minimum 0.015 inches thick.

4. Insulation Pins: Minimum 12 gauge Copper coated steel.

5. Speed Clips: Minimum 1 1/2 inches square or 1 1/2 inches diameter round or equivalent sized insulated cup - head pins of galvanized steel.

C. Identification Labels for Through Penetration Systems: Pressure sensitive self - adhesive vinyl labels, preprinted with the following information:

1. The words "Warning - Through Penetration Firestop System - Do not Disturb. Notify Building Management of Any Damage."

2. Listing agency's system number or designation.

3. System manufacturer's name, address, and phone number.

4. Installer's name, address, and phone number.

5. General contractor's name, address, and phone number (if applicable).

6. Date of installation.

PART 3 EXECUTION

3.1 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that firestopping assemblies are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core - drilled holes, or cut openings to accommodate through - penetration firestop systems.

C. Do not conceal firestopping installations until the Owner’s inspection agency or Authorities Having Jurisdiction have examined each installation.

D. Schedule firestopping after installation of penetrants but prior to concealing the openings.

E. Coordinate location and proper selection of cast - in - place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.

F. Coordinate with responsible trades to provide adequate spacing of field run pipes to allow for installation of cast - in - place firestop devices without interferences.

G. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.

3.2 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance. Conduct tests according to manufacturer's written recommendations to verify that substrates are free of oil, grease, rolling compounds, incompatible primers, loose mill scale, dirt and other foreign substances capable of impairing bond of firestopping.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Verify that all pipes, conduits, cables, and / or other items which penetrate fire - rated construction have been permanently installed prior to installation of firestops.

D. Verify that items penetrating fire rated assemblies are securely attached, including sleeves, supports, hangers, and clips.

E. Verify that openings and adjacent areas are not obstructed by construction that would interfere with installation of firestopping, including ducts, piping, equipment, and other suspended construction.

F. Verify that environmental conditions are safe and suitable for installation of firestopping.

G. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.3 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed

and identify conditions detrimental to proper or timely completion.

B. Verify penetrations are properly sized and in suitable condition for application of materials.

C. Surface Cleaning: Clean out openings immediately before installing firestop systems to comply with written recommendations of firestopping manufacturer and the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials, dirt, grease, oil, rust, water repellents, and any other substances that could interfere with adhesion of firestop systems.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestop systems. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form - release agents from concrete.

D. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

E. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

F. Do not proceed until unsatisfactory conditions have been corrected.

3.4 INSTALLATION - GENERAL

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.

C. Install in strict accordance with manufacturer's detailed installation instructions and procedures.

D. Install so that openings are completely filled and material is securely adhered.

E. Where firestopping surface will be exposed to view, finish to a smooth, uniform surface flush with adjacent surfaces.

F. After installation is complete, remove combustible forming materials and accessories that are not part of the listed system.

G. At each through penetration, attach identification labels on both sides in location where label will be visible to anyone seeking to remove penetrating items or firestopping.

H. Clean firestop materials off surfaces adjacent to openings as work progresses, using methods and cleaning materials approved in writing by firestop system manufacturer and which will not damage the surfaces being cleaned.

I. Notify authority having jurisdiction when firestopping installation is ready for inspection; obtain

advance approval of anticipated inspection dates and phasing, if any, required to allow subsequent construction to proceed.

J. Do not cover firestopping with other construction until approval of authority having jurisdiction has been received.

K. Through Penetration Firestop Systems (All Types Except Electrical Penetrations): Provide firestop systems listed for the specific combination of fire rated construction, type of penetrating item, annular space requirements, and fire rating, and:

1. F - Rating: Provide firestopping that has F - rating equal to or greater than the fire - resistance rating of the assembly in which the firestopping will be installed.

2. T - Rating: In habitable rooms and areas, where penetrating items are exposed to potential contact with materials on fire side(s) of rated assembly, provide firestopping that has a T - rating equal to its F - rating.

3. ll Penetrations: Provide systems that are symmetrical, with the same rating from both sides of the wall.

4. Cold Smoke Resistance: Provide firestopping that has L - rating of 1 cubic feet per minute per linear foot, maximum.

5. Testing: Determine ratings in accordance with ASTM E 814 or UL 1479.

L. Through Penetration Firestop System For Electrical Penetrations: Provide firestopping complying with UL system No.5, R11044, tested in accordance with UL 1709, ASTM E 119, ASTM E 1529, and ASTM E 1725.

3.5 INSTALLATION OF THROUGH - PENETRATION FIRESTOP SYSTEMS

A. Install forming / damming / backing materials and other accessories required to support fill materials during their application and in the position needed to produce cross - sectional shapes and depths required to achieve fire resistance ratings required.

B. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire - resistance ratings indicated.

2. Apply materials so they fully contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

4. Through Penetration Sealants with a Fungicide. Sealants must meet the requirements of ASTM G 21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

3.6 INSTALLATION OF WATERTIGHT THROUGH - PENETRATION FIRESTOP SYSTEMS

A. Install forming / damming / backing materials and other accessories required to support fill

material during their application and in the position needed to produce cross - sectional shapes and depths required to achieve fire ratings indicated. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop system.

B. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire - resistance ratings indicated.

2. Apply materials so they fully contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

4. Watertight - Meets UL Water Leakage Test - Class 1 requirements for systems tested and listed in accordance with the criteria of ASTM E 814 (UL 1479) Standard Test Method for Fire Tests of Through - Penetration Fire Stops. W Rating - Class 1 requirements include a minimum water column exposure of 3 feet for 72 hours prior to the standard time / temperature curve for the fire test.

5. Through Penetration Sealants with a Fungicide. Sealants must meet the requirements of ASTM G 21 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.

3.7 INSTALLATION OF FIREBLOCKING SEALANT

A. Install fill materials for fireblocking applications by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items as required to achieve the seal required to meet the intent of fireblocking code requirements.

2. Apply fill material so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing, finish to produce smooth, uniform surfaces that are flush with adjoining surfaces.

3.8 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.

B. Keep areas of work accessible until inspection by applicable code authorities.

C. Inspection of through - penetration firestopping shall be performed by the Manufacturer's Representative in accordance with ASTM E 2174, “Standard Practice for On - Site Inspection of Installed Fire Stops” or other recognized standard.

D. Perform under this section patching and repairing of firestopping caused by cutting or

penetrating of existing firestop systems already installed by other trades.

3.9 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by firestopping manufacturer(s) and that do not damage materials in which openings occur. Leave finished work in neat, clean condition with no evidence of spillovers or damage to adjacent surfaces. Neatly cut and trim materials as required.

B. Provide final protection and maintain conditions during and after installation that ensure firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestop systems immediately and install new materials to produce firestop systems complying with specified requirements.

C. Protect installed systems and products until completion of project; where subject to traffic, provide adequate protection board.

END OF SECTION